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EXAMINER

TRAN, TRANG U

ART UNIT

PAPER NUMBER

2614

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/840,481

Applicant(s)

VIGIL ET AL.

Examiner

Trang U. Tran

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claim 12 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 12 of copending Application No. 09/845,663. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Regarding claim 12 of this application, claim 12 of copending Application No. 09/09/845,663 recites the method of modifying the ATSC DTV standard transmission format by altering pilot signal amplitude by some appropriate level in the interest of subsequently reducing computational complexity required of correlation-based training-waveform processing, or in the interest of improving the accuracy of said reduced-complexity correlators over the accuracy possible with the presently specified pilot amplitude. However, claim 12 of copending Application No. 09/09/845,663 explicitly does not recite the claimed reducing pilot signal amplitude by 20% in the interest. It

would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate reducing pilot signal amplitude by 20% in the interest as appropriate level into the system of claim 12 of copending Application No. 09/09/845,663 because it merely selecting available level.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1-11 and 13-24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 and 5-11 of copending Application No. 09/845,663 in view of Grabb et al. (US Patent No. 6,437,832 B1).

Regarding claim 1 of this application, claim 1 of copending Application No. 09/845,663 recites a method of introducing legacy-compatible supplementary training waveform components into ATSC-compatible DTV transmission waveforms. However, claim 1 of copending Application No. 09/845,663 explicitly does not recite the claimed by exploiting ancillary data capability in said standard. Grabb et al teach that using digital signal processing, knowledge of the channel information at the receiver can be exploited to improve the digital television design, exploitation of the channel information in the receiver design can make the critical difference between being able to receive or not receive a particular digital TV channel in a home (Fig. 1, col. 2, lines 48-57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the exploiting ancillary data as taught by Grabb et al into the system of claim 1 of copending Application No. 09/845,663 in order to dynamically

estimate the channel and allow expeditious and effective mitigation of changing multipath conditions.

In considering claim 2, the combination of claim 1 of copending Application No. 09/845,663 and Grabb et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed by anticipating transmission signal processing, and compensating for same, in the generation and queueing of relevant ancillary data packets so as to induce the designed training waveform component, while preserving enough information in relevant ancillary packets so as to allow legacy and future receivers to distinguish these training waveform induction packets from desired information-bearing packets. Using introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets such as MPEG standard is old and well known in the art. Therefore, the Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the old and well known introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets into Grabb et al's system in order to provide the service either in an analog or digital format.

Regarding claim 3 of this application, the combination of claim 1 of copending Application No. 09/845,663 and Grabb et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed by introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets while passing sufficient data, undisturbed, from same placeholder packets so as to cause legacy and future receivers to distinguish those placeholder packets from desired information-bearing packets. Using introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets such as MPEG standard is old and well known in the art. Therefore, the Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the old and well known introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets into Grabb et al's system in order to provide the service either in an analog or digital format.

Regarding claim 4 of this application, claim 5 of copending Application No. 09/845,663 recites said training waveforms selected from a plurality or ensemble of

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selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through spare capacity in the ATSC DTV field sync segment or otherwise.

Regarding claim 5 of this application, claim 6 of copending Application No. 09/845,663 recites said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through information payload packets, or portions of information payload packets, designated for use as such.

Regarding claim 6 of this application, claim 7 of copending Application No. 09/845,663 recites said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through its correlation properties.

Regarding claim 7 of this application, claim 8 of copending Application No. 09/845,663 recites a method of gradually improving multipath resilience of ATSC DTV standard broadcast and reception systems by gradually introducing, over time, various additive supplemental training or reference waveforms for inclusion, selectably or otherwise, per the method of claim 1.

Regarding claim 8 of this application, claim 2 of copending Application No. 09/845,663 recites so as to derive maximum benefit, with respect to equalization subject to known channel multipath characteristics, through appropriate selection of length, periodicity and processing gain of same said supplemental training waveform

components, said selection subject to pre-existing ATSC DTV transmission signal periodicities and configuration.

Regarding claim 9 of this application, claim 9 of copending Application No. 09/845,663 recites by employing those components to more quickly, frequently and/or reliably train pre-demodulation equalizers.

Regarding claim 10 of this application, claim 10 of copending Application No. 09/845,663 recites by passing the received transmission waveform through a correlator, digital or otherwise, to extract multipath channel response characteristics for use in more quickly, frequently and/or reliably training pre-demodulation equalizers.

Regarding claim 11 of this application, claim 11 of copending Application No. 09/845,663 recites by passing the received transmission waveform through a digital correlator, said correlator implemented with reduced complexity based on the use of bit shifts and sign changes instead of multiplication, yielding a correlator implementation limited to addition operations or to addition operations and a minimum number of bit shifts, and said correlation process for the purpose of extracting multipath channel response characteristics for use in more quickly, frequently and/or reliably training pre-demodulation equalizers.

Claim 13 of this application are rejected over claim 1 of copending Application No. 09/845,663 for the same reason as discussed in claim 1.

Claims 14-15 of this application are rejected for the same reason as discussed in claims 2-3, respectively.

Claims 16-17 of this application are rejected over claims 5 and 6 of copending Application No. 09/845,663 for the same reason as discussed in claims 4-5, respectively.

Regarding claim 18 of this application, the claimed said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through new signaling means introduced into the legacy modulation waveform is met by modulation waveform 305 (Fig. 3, col. 4, lines 22-45 and col. 5, line 66 to col. 6, line 54).

Claims 19-20 of this application are rejected over claims 6-7 of copending Application No. 09/845,663 for the same reason as discussed in claims 5-6, respectively.

Claim 21 of this application are rejected over claim 2 of copending Application No. 09/845,663 for the same reason as discussed in claim 8.

Claims 22-24 of this application are rejected over claims 9-11 of copending Application No. 09/845,663 for the same reason as discussed in claims 9-11, respectively.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 4, 6-11, 13, 18 and 20-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Grabb et al (US Patent No. 6,437,832 B1).

Regarding claim 1, Grabb et al discloses all the claimed subject matter, note 1) the claimed a method of introducing legacy-compatible supplementary training waveform components into ATSC-compatible DTV transmission waveforms by exploiting ancillary data capability in said standard is met by a transmitter 101 which accepts, from a summer 104, a DTV signal to which an ultra wideband overlay signal produced by a sequence generator 103 has been added in summer 104 (Fig. 1, col. 2, lines 48-57 and col. 4, lines 8-45).

Regarding claim 4, the claimed said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through spare capacity in the ATSC DTV field sync segment or otherwise is met by Fig. 8, col. 2, lines 38-65 and col. 6, line 40 col. 7, line 12.

Regarding claim 6, the claimed said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through its correlation properties is met by the m-sequence overlay signal generator (Fig. 3, col. 4, lines 22-45 and col. 5, line 66 to col. 6, line 54).

Regarding claim 7, the claimed a method of gradually improving multipath resilience of ATSC DTV standard broadcast and reception systems by gradually

introducing, over time, various additive supplemental training or reference waveforms for inclusion, selectably or otherwise, per the method of claim 1 is met by the m-sequence overlay signal generator (Fig. 3, col. 4, lines 22-45 and col. 5, line 66 to col. 6, line 54).

Regarding claim 8, the claimed so as to derive maximum benefit, with respect to equalization subject to known channel multipath characteristics, through appropriate selection of length, periodicity and processing gain of same said supplemental training waveform components, said selection subject to pre-existing ATSC DTV transmission signal periodicities and configuration is met by the m-sequence overlay signal generator (Fig. 3, col. 4, lines 22-45 and col. 5, line 66 to col. 6, line 54).

Regarding claim 9, the claimed by employing those components to more quickly, frequently and/or reliably train pre-demodulation equalizers is met by the equalizer 112 (Figs. 1 and 2, col. 4, line 46 to col. 5, line 65).

Regarding claim 10, the claimed by passing the received transmission waveform through a correlator, digital or otherwise, to extract multipath channel response characteristics for use in more quickly, frequently and/or reliably training pre-demodulation equalizers is met by the cross-correlator 108 and the equalizer 112 (Figs. 1 and 2, col. 4, line 46 to col. 5, line 65).

Regarding claim 11, the claimed by passing the received transmission waveform through a digital correlator, said correlator implemented with reduced complexity based on the use of bit shifts and sign changes instead of multiplication, yielding a correlator implementation limited to addition operations or to addition operations and a minimum

number of bit shifts, and said correlation process for the purpose of extracting multipath channel response characteristics for use in more quickly, frequently and/or reliably training pre-demodulation equalizers is met by the cross-correlator 108 and the equalizer 112 (Figs. 1 and 2, col. 4, line 46 to col. 6, line 39).

Claim 13 is rejected for the same reason as discussed in claim 1.

Regarding claim 18, the claimed said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through new signaling means introduced into the legacy modulation waveform is met by modulation waveform 305 (Fig. 3, col. 4, lines 22-45 and col. 5, line 66 to col. 6, line 54).

Claim 20 is rejected for the same reason as discussed in claim 6.

Claim 21 is rejected for the same reason as discussed in claim 8.

Claims 22-24 are rejected for the same reason as discussed in claims 9-11, respectively.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-3, 5, 14-15, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grabb et al (US Patent No. 6,437,832 B1).

Regarding claim 2, Grabb et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed by anticipating transmission signal processing, and compensating for same, in the generation and queueing of relevant ancillary data packets so as to induce the designed training waveform component, while preserving enough information in relevant ancillary packets so as to allow legacy and future receivers to distinguish these training waveform induction packets from desired information-bearing packets. Using relevant ancillary data packets so as to induce the designed training waveform component, while preserving enough information in relevant ancillary packets so as to allow legacy and future receivers to distinguish these training waveform induction packets from desired information-bearing packets such as MPEG standard is old and well known in the art. Therefore, the Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the old and well known relevant ancillary data packets so as to induce the designed training waveform component, while preserving enough information in relevant ancillary packets so as to allow legacy and future receivers to distinguish these training waveform induction packets from desired information-bearing packets into Grabb et al's system in order to provide the service either in an analog or digital format.

Regarding claim 3, Grabb et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed by introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation

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waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets while passing sufficient data, undisturbed, from same placeholder packets so as to cause legacy and future receivers to distinguish those placeholder packets from desired information-bearing packets. Using introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets such as MPEG standard is old and well known in the art. Therefore, the Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the old and well known introducing appropriate "placeholder" packets in the packet data stream, then generating intentionally designed supplemental training waveform components in the modulation waveform at time instances corresponding to those which map from the "placeholder" training symbol induction packets into Grabb et al's system in order to provide the service either in an analog or digital format.

Regarding claim 5, Grabb et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through information payload packets, or portions of information payload packets, designated for use as such. Using the information payload packets, or portions of information payload packets such as MPEG standard is old and well known in the art. Therefore, the Official

Notice is taken. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the old and well known information payload packets, or portions of information payload packets into Grabb et al's system in order to provide the service either in an analog or digital format.

Claims 14-15 are rejected for the same reason as discussed in claims 2-3, respectively.

Claim 17 is rejected for the same reason as discussed in claim 5.

Claim 19 is rejected for the same reason as discussed in claim 5.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Welles, II et al (US Patent No. 6,417,890 B1).

Regarding claim 12, Welles, II et al discloses all the claimed subject matter, note 1) the claimed the method of modifying the ATSC DTV standard transmission format by altering pilot signal amplitude by some appropriate level in the interest of subsequently reducing computational complexity required of correlation-based training-waveform processing, or in the interest of improving the accuracy of said reduced-complexity correlators over the accuracy possible with the presently specified pilot amplitude is met by the transmitting system 10 (Figs. 1 and 2, col. 2, line 23 to col. 3, line 34). However, Welles, II et al explicitly does not recites the claimed reducing pilot signal amplitude by 20% in the interest. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate reducing pilot signal amplitude by 20% in the interest as appropriate level into Welles, II et al's system because it merely selecting available level.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grabb et al (US Patent No. 6,437,832 B1) in view of Sershey et al (US Patent No. 6,498,627B1).

Regarding claim 16, Grabb et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed said training waveforms selected from a plurality or ensemble of selections, where each selection or combination of selections is identifiable to the receiver through signaling means available through spare capacity in the modulation field to convey configuration and control overhead information. Sershey et al teach that the new center frequency is tied to the category of the EAS message, when the brevity signaling receiver module detects the shift of the center frequency, controller 34 signals the appropriate DTV receiver circuits that the wideband overlay signal is temporarily not to be used for channel equalization but rather is being used to convey an EAS message (Fig. 1, col. 3, line 59 to col. 4, line 38). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the EAS message as taught by Sershey et al into Grabb et al's system in order to use of an overlay signal in the DTV transmission for brevity signaling for public safety.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Frey et al. (US Patent No. 6,304,299 B1) disclose system and method for mitigating multipath effects in television systems.

Gans et al. (US Patent No. 5,943,372) disclose orthogonal polarization and time varying offsetting of signals for digital data transmission or reception.

Sershey et al. (US Patent No. 5,680,143) disclose method and apparatus for a low complexity satellite ranging system using gaussian noise overlay.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Trang U. Tran** whose telephone number is **(703) 305-0090**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **John W. Miller**, can be reached at **(703) 305-4795**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231


or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

TT TT
August 21, 2003


MICHAEL H. LEE
PRIMARY EXAMINER